

CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME III

Editors:

Md. Zahangir Alam
Ahmed Tariq Jameel
Azura Amid



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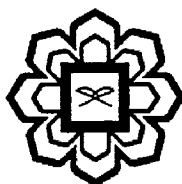
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**Department of Biotechnology Engineering
Faculty of Engineering
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CHAPTER 19

FOWL CHOLERA VACCINE PRODUCTION: PROCESS OPTIMIZATION IN LABORATORY SCALE FERMENTER

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ABSTRACT

The process optimization of *Pasteurella multocida* fermentation for fowl cholera vaccine production in 2L laboratory scale fermenter was successfully carried out in stirred tank reactor (STR). This study focuses on the maximizing the cell growth and protein production of *P. multocida* by optimizing process of various fermentation condition. The process optimization was designed for different level of parameters that were dissolved oxygen concentration (pO₂), stirrer speed (rpm) and pH using Taguchi's Experimental Robust Design by STATISTICA 6.0 software. From the result obtained, the yield of biomass was significantly affected by higher agitation (200 rpm) and for antigen protein production was significantly affected by lower pO₂ level (1 vvm). The correlation between the parameters was very affecting the productivity of the vaccine produced.

Keywords *Fowl Cholera, vaccine, optimization, and fermenter*

INTRODUCTION

According to the livestock statistics in 1999 (DVS, 2003), the total population of rural chickens in the country is 90 million birds. With a projected 10 % increase per year estimated population in 2006 would be more 150 million. Assuming only 50 % of the birds are vaccinated and for optimum protection, it is recommended to vaccine 2 doses for broiler and 3 doses for layers and breeders. Therefore, more than 300 million doses of fowl cholera will be needed. Currently, Veterinary Research Institute is the only placed that produce fowl cholera vaccine by utilizing cumbersome method. According to the statistic given by VRI, they only can manage the vaccine production around 2 million doses per year, thus to overcome the shortage, vaccine were imported from others country. This shortage of vaccine has created the need of Fowl Cholera vaccine to be produced from local strain in order to reduce further economic losses to the poultry